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EXAMINER	
THANGAVELU, KANDASAMY	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 08/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/976,187	SIMMONS ET AL.	
	Examiner	Art Unit	
	Kandasamy Thangavelu	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/10/2006, 4/18/2006 and 8/14/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *55,56 and 58-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to the Applicants' Response mailed on April 10, 2006, April 18, 2006 and August 14, 2006. Claims 69, 72, 74 and 75 were amended. Claim 57 was cancelled. Claim 82 was added. Claims 55-56, 58-82 of the application are pending. This office action is made non-final.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 55, 56, 58-60, 71, 74 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000).

4.1 **Hall et al.** teaches Method of optimizing design of an HVAC air-conditioning assembly for a climate control system. Specifically as per claim 55, **Hall et al.** teaches a computer-readable medium storing a computer program for designing an HVAC system (Abstract; Fig.1; Fig. 6, Item 1010; CL1, L8-11; CL8, L42-52), the computer program comprising:

an input module configured to receive inputs corresponding to design elements, characterized by properties stored in records, the design elements being connectable to establish an HVAC system to be designed (CL4, L1-4; CL4, L52-67);

a design module operably connected to the input module and configured to operate on the inputs to create the records reflecting the properties of the design elements and interactions thereof to establish a design of the HVAC system (Fig. 1; CL3, L50 to CL4, L4); and

an output module configured to provide a user-interpretable output corresponding to the HVAC system (CL4, L50-52; CL5, L13-16).

Hall et al. does not expressly teach the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element; and to automatically maintain

substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts. **Laine et al.** teaches the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element; and to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts (Page 279, Para 4: individual **design tools ... integrated** ... used in a timely and effective manner ... the prototype linked together an architectural CAD system, a 3-D space model, a CFD program and a building energy simulation program; Page 282, Para 2: by **modeling geometry**, spatial relationships and objects like walls and windows using the 3-D space modeler, the information can be used in other design tools such as energy simulation and CFD; Fig. 3.3: space modeler build on top of CAD software; Page 282, Para 3: an energy simulation tool is used for energy analysis and HVAC equipment sizing; Page 283, Para 1: energy simulation programs calculate an **average temperature in the space**; Page 283, Para 2: with a CFD program, air-flow pattern and **the distribution of air velocity, air temperature** and the contaminant concentrations can be calculated; Figure 5: shows results from the CFD program: **air velocities and air temperatures** at noon in the same office; Page 283, Para 3: Energy simulation results such as **surface temperatures** can be used as boundary conditions in CFD program; CFD can be used in the selection of **air-flow rates**, and can generate estimates of **convective heat transfer** coefficients; methods of using CFD results to support **energy calculations** have been identified). It would have been obvious to one of ordinary skill in the art

at the time of Applicants' invention to modify the computer-readable medium of **Hall et al.** with the computer-readable medium of **Laine et al.** that included the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element; and to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts, because that would allow modeling geometry with spatial relationships and objects like walls and windows, so the information can be used in other design tools such as energy simulation and CFD (Page 282, Para); energy simulation results can be used for energy analysis and HVAC equipment sizing(Page 282, Para 3); air-flow pattern and the distribution of air velocity, air temperature and the contaminant concentrations can be calculated (Page 283, Para 2); distributions of air velocities and air temperatures in the space can be displayed (Figure 5); energy simulation results such as surface temperatures can be used as boundary conditions in CFD program; CFD can be used in the selection of air-flow rates, and can generate estimates of convective heat transfer coefficients; CFD results can be used to support energy calculations (Page 283, Para 3).

Per claim 56: **Hall et al.** teaches that the computer program further comprises a user interface module configured to receive inputs from a user to control selection, relative positioning, and properties of design elements of the HVAC system to be designed (CL4, L1-4; CL4, L52-67); and configured to output to a user a graphical representation of the HVAC system reflecting

the selection, relative positioning, and properties of the design elements (CL4, L18-33; Fig. 5, Item 240; CL4, L50-52).

Per claim 58: **Hall et al.** teaches that the input module further comprises a user interface module configured to receive inputs from a user to control selection, relative positioning, and properties of design elements of the HVAC system (CL4, L1-4; CL4, L52-67); and

output to a user a graphical representation of the HVAC system reflecting the selection, relative positioning, and properties of the design elements (CL4, L18-33; Fig. 5, Item 240; CL4, L50-52).

Per claim 59: **Hall et al.** teaches that the operational contexts are selected from mass transport and energy transport (CL7, L50-56).

Per claim 60: **Hall et al.** teaches that mass transport includes at least one of air transport and water transport, and wherein energy transport includes at least one of heating and cooling with respect to the selected design element (CL7, L50-56).

4.2 As per claim 71, **Hall et al.** and **Laine et al.** teach the computer-readable medium of claim 55. **Hall et al.** teaches that the output module is further configured to do at least one of generating reports, drawing schematic illustrations, providing schedules of components, and providing performance analyses reflecting the design elements (CL4, L50-52; CL5, L13-1; CL4, L18-27).

4.3 As per claim 74, **Hall et al.** and **Laine et al.** teach the computer-readable medium of claim 56. **Hall et al.** teaches that the user interface further comprises a selection module providing a palette of icons representing design elements selectable arbitrarily by a user and connectable to one another in a schematic work space to establish the HVAC system design (CL4, L1-2; CL4, L52-60; CL4, L61-67).

4.4 As per claim 82, **Hall et al.** teaches a computer-readable medium storing a computer program for designing an HVAC system (Abstract; Fig.1; Fig. 6, Item 1010; CL1, L8-11; CL8, L42-52), the computer program comprising:

an input module configured to receive inputs corresponding to design elements, characterized by properties stored in records, the design elements being connectable to establish an HVAC system to be designed (CL4, L1-4; CL4, L52-67);

a design module operably connected to the input module and configured to operate on the inputs to create the records reflecting the properties of the design elements and interactions thereof to establish a design of the HVAC system (Fig. 1; CL3, L50 to CL4, L4); and

an output module configured to provide a user-interpretable output corresponding to the HVAC system (CL4, L50-52; CL5, L13-16).

Hall et al. does not expressly teach the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting

distinct operational contexts of the selected design element, the distinct operational contexts comprising a first operational context, representing transport of mass, and a second operational context, representing the transport of energy; the design and input module, further configured to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts. **Laine et al.** teaches the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element, the distinct operational contexts comprising a first operational context, representing transport of mass, and a second operational context, representing the transport of energy; the design and input module, further configured to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts (Page 279, Para 4: individual **design tools ... integrated** ... used in a timely and effective manner ... the prototype linked together an architectural CAD system, a 3-D space model, a CFD program and a building energy simulation program; Page 282, Para 2: by **modeling geometry**, spatial relationships and objects like walls and windows using the 3-D space modeler, the information can be used in other design tools such as energy simulation and CFD; Fig. 3.3: space modeler build on top of CAD software; Page 282, Para 3: an energy simulation tool is used for energy analysis and HVAC equipment sizing; Page 283, Para 1: energy simulation programs calculate an **average temperature in the space**; Page 283, Para 2: with a CFD program, air-flow pattern and **the distribution of air velocity, air temperature** and

the contaminant concentrations can be calculated; Figure 5: shows results from the CFD program: **air velocities and air temperatures** at noon in the same office; **air velocity represents transport of mass and temperature distribution represents transport of energy**; Page 283, Para 3: Energy simulation results such as **surface temperatures** can be used as boundary conditions in CFD program; CFD can be used in the selection of **air-flow rates**, and can generate estimates of **convective heat transfer** coefficients; methods of using CFD results to support **energy calculations** have been identified).

5. Claims 61-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000), and further in view of **Harrington** (U.S. Patent 5,895,454).

5.1 As per claim 61, **Hall et al.** and **Laine et al.** teach the computer-readable medium of claim 55. **Hall et al.** and **Laine et al.** do not expressly teach that the selected design element comprises a product available from a vendor, independent from the article, the product characterized by product properties corresponding thereto; and the design module further comprises a specification module, executable to assign the product properties as the properties of the selected design element. **Harrington** teaches that the selected design element comprises a product available from a vendor, independent from the article, the product characterized by product properties corresponding thereto (Abstract, L1-4); and the design module further comprises a specification module, executable to assign the product properties as the properties of

the selected design element (Abstract, L4-7 and L10-13). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer-readable medium of **Hall et al.** and **Laine et al.** with the computer-readable medium of **Harrington** that included the selected design element comprising a product available from a vendor, independent from the article, the product characterized by product properties corresponding thereto; and the design module further comprising a specification module, executable to assign the product properties as the properties of the selected design element, because that would allow a user with a selection of several vendor sites to select the vendor products that met the user's product/service specifications (Abstract, L5-9); and would allow the user to view, select, order and pay for products and services using the internet and remote vendor websites (CL1, L10-14).

5.2 As per claims 62-64, **Hall et al., Laine et al.** and **Harrington** teach the computer-readable medium of claim 61. **Hall et al.** and **Laine et al.** do not expressly teach that the computer program further comprise a product module configured to manage data reflecting the product properties; the product module further comprises an updating module configured to update the product proper; and the computer program further comprise a communication module configured to automatically establish communication between a user and the vendor of the product. **Harrington** teaches that the computer program further comprise a product module configured to manage data reflecting the product properties (Abstract, L4-7 and L10-13); the product module further comprises an updating module configured to update the product proper (Abstract, L10-13); and the computer program further comprise a communication module

configured to automatically establish communication between a user and the vendor of the product (Abstract, L4-7 and L10-13).

5.3 As per claim 65, **Hall et al., Laine et al.** and **Harrington** teach the computer-readable medium of claim 64. **Hall et al.** and **Laine et al.** do not expressly teach that the communication module is further configured to do at least one of making inquiries of the vendor, placing orders with the vendor, and downloading updated values of the product properties from the vendor. **Harrington** teaches that the communication module is further configured to do at least one of making inquiries of the vendor, placing orders with the vendor, and downloading updated values of the product properties from the vendor (Abstract, L4-17).

6. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000), and further in view of **Subbarao** (U.S. Patent 6,134,511).

6.1 As per claim 66, **Hall et al.** and **Laine et al.** teach the computer-readable medium of claim 55. **Hall et al.** and **Laine et al.** do not expressly teach that the computer program further comprise a load module configured to provide, to the input module HVAC loading parameters required to be accommodated by the HVAC system. **Subbarao** teaches that the computer program further comprise a load module configured to provide, to the input module HVAC loading parameters required to be accommodated by the HVAC system (CL1, L35-40; CL1,

L46-48). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer program of **Hall et al.** and **Laine et al.** with the computer program of **Subbarao** that included the data structures further comprising a load module configured to provide, to the input module HVAC loading parameters required to be accommodated by the HVAC system, because the HVAC loading parameters would provide the amount of heat to be supplied or removed to provide the specified space conditioning (CL1, L38-40), accounting for the complex details of the building, the HVAC system, weather conditions and occupancy characteristics (CL1, L46-48).

7. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000), and further in view of **Subbarao** (U.S. Patent 6,134,511), and **Pray et al.** (U.S. Patent 4,885,694).

7.1 As per claim 67, **Hall et al., Laine et al.** and **Subbarao** teach the computer-readable medium of claim 66. **Hall et al.** teaches that the data structures further comprise a CAD module configured to provide, to the input module, data reflecting a design of a vehicle interior (Abstract, L1-2; CL4, L5-12; CL7, L4-6; CL7, L32-35). **Hall et al., Laine et al.** and **Subbarao** do not expressly teach that the computer program further comprise a CAD module configured to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system. **Pray et al.** teaches that the computer program further comprise a CAD module configured to provide, to the input module, data reflecting a design of an edifice to be

serviced by the design of the HVAC system (CL1, L6-9; CL1, L30-45; CL3, L60-61; CL4, L50-51). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer program of **Hall et al., Laine et al.** and **Subbarao** with the computer program of **Pray et al.** that included the data structures further comprising a CAD module configured to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system, because that would allow the computer system to automate the design of the building control system such as the HVAC system (CL1, L30-32; CL1, L6-9).

8. Claims 68-70, 72 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000), and further in view of **Subbarao** (U.S. Patent 6,134,511), **Pray et al.** (U.S. Patent 4,885,694) and **Harrington** (U.S. Patent 5,895,454).

8.1 As per claim 68, **Hall et al., Laine et al., Subbarao** and **Pray et al.** teach the computer-readable medium of claim 67. **Hall et al., Laine et al., Subbarao** and **Pray et al.** do not expressly teach that the computer program further comprise a product module configured to specify products available for sale and meeting requirements to be the design elements. **Harrington** teaches that the computer program further comprise a product module configured to specify products available for sale and meeting requirements to be the design elements (Abstract, L4-7 and L10-13).

8.2 As per claim 69, **Hall et al., Laine et al., Subbarao, Pray et al.** and **Harrington** teach the computer-readable medium of claim 68. **Hall et al., Laine et al., Subbarao** and **Pray et al.** do not expressly teach that the computer program further comprise a compensation module configured to identify monetary compensation due to a provider of the computer program from vendors of the products specified as design elements in the HVAC system. **Harrington** teaches that the computer program further comprise a compensation module configured to identify monetary compensation due to a user from vendors of the products specified as design elements in the HVAC system (CL1, L6-14).

8.3 As per claim 70, **Hall et al.** and **Laine et al.** teach the computer-readable medium of claim 55. **Hall et al.** teaches that the input module is further configured to interact with a CAD module provided by an independent third party to provide, to the input module, data reflecting a design of a vehicle interior (Abstract, L1-2; CL4, L5-12; CL7, L4-6; CL7, L32-35). **Hall et al.** and **Laine et al.** do not expressly teach that the input module is further configured to interact with a CAD module provided by an independent third party to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system. **Pray et al.** teaches that the input module is further configured to interact with a CAD module provided by an independent third party to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system (CL1, L6-9; CL1, L30-45; CL3, L60-61; CL4, L50-51).

Hall et al., Laine et al. and **Pray et al.** do not expressly teach a load module configured to receive outputs from the CAD module and provide, to the input module, HVAC loading parameters required to be met by the HVAC system design. **Subbarao** teaches a load module configured to receive outputs from the CAD module and provide, to the input module, HVAC loading parameters required to be met by the HVAC system design (CL1, L35-40; CL1, L46-48).

Hall et al., Laine et al., Pray et al. and **Subbarao** do not expressly teach a vendor module, provided by an independent vendor and configured to specify products available for sale and meeting the requirements to be the design elements. **Harrington** teaches a vendor module, provided by an independent vendor and configured to specify products available for sale and meeting the requirements to be the design elements (Abstract, L4-7 and L10-13).

8.4 As per claim 72, **Hall et al., Laine et al., Subbarao, Pray et al.** and **Harrington** teach the computer-readable medium of claim 68. **Hall et al., Laine et al., Pray et al.** and **Subbarao** do not expressly teach that the product module further comprises a specification module configured to provide a detailed specification for an arbitrary number of selected design elements. **Harrington** teaches that the product module further comprises a specification module configured to provide a detailed specification for an arbitrary number of selected design elements (Abstract, L4-7 and L10-13

8.5 As per claim 73, **Hall et al., Laine et al., Subbarao, Pray et al.** and **Harrington** teach the computer-readable medium of claim 72. **Hall et al., Laine et al., Pray et al.** and **Subbarao**

do not expressly teach that the product module further comprises product data corresponding to products available from vendors to serve as the design elements; and the specification module further comprises a filter module configured to sort the products by features thereof and priorities of the features, each selectable by a user, in order to automatically specify detailed parameters characterizing a product selected by a user to serve as the selected design element. **Harrington** teaches that the product module further comprises product data corresponding to products available from vendors to serve as the design elements (Abstract, L1-4); and the specification module further comprises a filter module configured to sort the products by features thereof and priorities of the features, each selectable by a user, in order to automatically specify detailed parameters characterizing a product selected by a user to serve as the selected design element (Abstract, L4-7 and L10-13).

9. Claims 75-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Gibino et al.** (U.S. Patent 6,179,213), and further in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000).

9.1 As per claim 75, **Hall et al.** teaches a method for designing an HVAC system (Abstract; Fig.1; Fig. 6, Item 1010; CL1, L8-11; CL8, L42-52), the method comprising:

providing a database having records and configured to manage values of properties corresponding to design elements corresponding to substantially all physical components and connections available for creating an HVAC system design (CL4, L1-4; CL4, L52-67);

providing a user interface configured to represent design elements arbitrarily selectable by a user and connectable to one another in a schematic to establish the HVAC system design (Fig. 1; CL3, L50 to CL4, L4; CL4, L18-33; CL4, L52-67; CL5, L44-47; CL7, L1-2);

selecting arbitrarily, from the design elements, by a user, an arbitrary number of selected design elements to be interconnected in the HVAC system design (CL4, L1-4; CL4, L52-67);

selecting, by a user, a relative location and interconnections corresponding to each selected design element (CL4, L1-4; CL4, L52-6);

calculating, automatically, values of properties characterizing the arbitrary design elements (CL7, L50-56; CL7, L66 to CL8, L1);

validating correctness of the interconnections and properties (CL8, L2-15);

calculating performance parameters corresponding to the HVAC system design (CL7, L50-56; CL7, L66 to CL8, L1); and

providing drawings defining the HVAC system design for construction (CL4, L18-33; Fig. 5, Item 240; CL4, L50-52).

Hall et al. does not expressly teach providing, automatically, default values corresponding to the properties corresponding to the design elements. **Gibino et al.** teaches providing, automatically, default values corresponding to the properties corresponding to the design elements (CL2, L12-19). It would have been method of **Hall et al.** with the method of **Gibino et al.** that included providing, automatically, default values corresponding to the properties corresponding to the design elements, because that would allow providing default

design conditions initially, and overruling or modifying the design from default conditions when needed (CL2, L14-19).

Hall et al. does not expressly teach automatically providing multiple schematic representations of at least one of the selected design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design elements. **Laine et al.** teaches automatically providing multiple schematic representations of at least one of the selected design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design elements (Page 279, Para 4: individual **design tools ... integrated** ... used in a timely and effective manner ... the prototype linked together an architectural CAD system, a 3-D space model, a CFD program and a building energy simulation program; Page 282, Para 2: by **modeling geometry**, spatial relationships and objects like walls and windows using the 3-D space modeler, the information can be used in other design tools such as energy simulation and CFD; Fig. 3.3: space modeler build on top of CAD software; Page 282, Para 3: an energy simulation tool is used for energy analysis and HVAC equipment sizing; Page 283, Para 1: energy simulation programs calculate an **average temperature in the space**; Page 283, Para 2: with a CFD program, air-flow pattern and **the distribution of air velocity, air temperature** and the contaminant concentrations can be calculated; Figure 5: shows results from the CFD program: **air velocities and air temperatures** at noon in the same office; Page 283, Para 3: Energy simulation results such as **surface temperatures** can be used as boundary conditions in CFD program; CFD can be used in the selection of **air-flow rates**, and can generate estimates of **convective heat transfer** coefficients; methods of using CFD results to support **energy calculations** have been identified).

Per claim 76: **Hall et al.** teaches creating and outputting schedules specifying each of the arbitrarily selected design elements (CL3, L64 to CL4, L4; CL4, L18-25; CL5, L13-16; CL7, L22-24).

10. Claims 77-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Gibino et al.** (U.S. Patent 6,179,213), and further in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000) and **Harrington** (U.S. Patent 5,895,454).

10.1 As per claim 77, **Hall et al., Gibino et al.** and **Laine et al.** teach the method of claim 76. **Hall et al., Gibino et al.** and **Laine et al.** do not expressly teach providing a list of products and corresponding vendors meeting the performance parameters corresponding to the selected design elements. **Harrington** teaches providing a list of products and corresponding vendors meeting the performance parameters corresponding to the selected design elements (Abstract, L4-7 and L10-13).

10.2 As per claim 78, **Hall et al., Gibino et al.** and **Harrington** teach the method of claim 77. **Hall et al.** does not expressly teach automatically downloading from a vendor updated lists of products and corresponding properties. **Harrington** teaches automatically downloading from a vendor updated lists of products and corresponding properties (Abstract, L4-7 and L10-13).

11. Claims 79-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hall et al.** (U.S. Patent 6,651,037) in view of **Gibino et al.** (U.S. Patent 6,179,213), and further in view of **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000) and **Subbarao** (U.S. Patent 6,134,511).

11.1 As per claim 79, **Hall et al., Gibino et al.** and **Laine et al.** teach the method of claim 75. **Hall et al., Gibino et al.** and **Laine et al.** do not expressly teach obtaining, from a loads program, selected performance parameter requirements corresponding to the design elements. **Subbarao** teaches obtaining, from a loads program, selected performance parameter requirements corresponding to the design elements (CL1, L35-40; CL1, L46-48).

11.2 As per claim 80, **Hall et al., Gibino et al., Laine et al.** and **Subbarao** teach the method of claim 79. **Hall et al.** teaches providing an input module configured to support user selection of design elements (CL4, L1-4; CL4, L52-67).

Hall et al., Gibino et al. and **Laine et al.** do not expressly teach interacting the input module with the loads program to provide selected inputs automatically to the input module. **Subbarao** teaches obtaining, from a loads program, selected performance parameter requirements corresponding to the design elements (CL1, L35-40; CL1, L46-48).

11.3 As per claim 81, **Hall et al., Gibino et al., Laine et al.** and **Subbarao** teach the method of claim 80. **Hall et al.** teaches computer program further comprising a CAD module configured

to provide, to the input module, data reflecting a design of a vehicle interior (Abstract, L1-2; CL4, L5-12; CL7, L4-6; CL7, L32-35). **Hall et al., Gibino et al.** and **Laine et al.** do not expressly teach providing a CAD program to provide inputs, corresponding to a structure to be served by the HVAC design, into the loads program. **Subbarao** teaches providing a CAD program to provide inputs, corresponding to a structure to be served by the HVAC design, into the loads program (CL1, L35-40; CL1, L46-48).

Response to Arguments

12. Applicants' arguments filed on April 10, 2006 have been fully considered. The arguments with respect to 103 (a) rejections are persuasive.

12.1 As per the applicants' argument that "Hall does not teach "an input module and design module, configured to automatically provide multiple schematic representations reflecting distinct operational contexts of the selected design element"; as illustrated, Figure 5 shows the selection of a heating coil ... the heating coil in an air flow schematic and a second schematic representation 184 of the same heating coil in a separate hydronic schematic; ... multiple schematic representations recited in claim 55 refer to the first and second schematic representations 184b and 184c and the distinct operational contexts refer to the air flow and hydronic schematics; these operational contexts may include, for example, an "air handler," "air flow," or "hydronic" schematic which may represent the transport of mass, energy, or the like; furthermore, by "automatically providing multiple schematic representations," as required by claim 55, a user

does not need to place every possible schematic representation of a component in a project", the examiner has used a new reference **Laine et al.** ("Better IAQ through integrating design tools for the HVAC industry", Proceedings of the Healthy Buildings, 2000, Vol. 4, August 2000).

Hall et al. does not expressly teach the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element; and to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts. **Laine et al.** teaches the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element; and to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts (Page 279, Para 4: individual **design tools ... integrated** ... used in a timely and effective manner ... the prototype linked together an architectural CAD system, a 3-D space model, a CFD program and a building energy simulation program; Page 282, Para 2: by **modeling geometry**, spatial relationships and objects like walls and windows using the 3-D space modeler, the information can be used in other design tools such as energy simulation and CFD; Fig. 3.3: space modeler build on top of CAD software; Page 282, Para 3: an energy simulation tool is used for energy analysis and HVAC equipment sizing; Page 283, Para 1:

energy simulation programs calculate an **average temperature in the space**; Page 283, Para 2: with a CFD program, air-flow pattern and **the distribution of air velocity, air temperature** and the contaminant concentrations can be calculated; Figure 5: shows results from the CFD program: **air velocities and air temperatures** at noon in the same office; Page 283, Para 3: Energy simulation results such as **surface temperatures** can be used as boundary conditions in CFD program; CFD can be used in the selection of **air-flow rates**, and can generate estimates of **convective heat transfer** coefficients; methods of using CFD results to support **energy calculations** have been identified).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez, can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu
Art Unit 2123
August 25, 2006